

**Final
Site-Specific Field Sampling Plan,
Site-Specific Safety and Health Plan, and Site-Specific
Unexploded Ordnance Safety Plan Attachments,
Range 4A Fog Oil Storage Area – Pelham Range,
Parcel 123(6)**

**Fort McClellan
Calhoun County, Alabama**

**Task Order CK05
Contract No. DACA21-96-D-0018
IT Project No. 774645**

March 2001

**Final
Site-Specific Field Sampling Plan Attachment
Range 4A Fog Oil Storage Area – Pelham Range,
Parcel 123(6)**

**Fort McClellan
Calhoun County, Alabama**

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Revision 1

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See Attachment 1, List of Abbreviations and Acronyms

Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Delivery Order CK05, IT Corporation (IT) will conduct site investigation activities at Range 4A Fog Oil Storage Area – Pelham Range, Parcel 123(6), at Fort McClellan, Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site. The purpose of this site-specific field sampling plan is to provide technical guidance for sampling activities at Range 4A Fog Oil Storage Area, Parcel 123(6).

Range 4A Fog Oil Storage Area, Parcel 123(6), is located in north central Pelham Range and is due west of Range 56 in Training Area 4A of Pelham Range. The area had been designed for storage of fog oil used to generate smoke for training exercises at Fort McClellan and Pelham Range and is believed to have been in use since at least 1964. The storage capacity at Range 4A Fog Oil Storage Area is 75,000 gallons. The Fog Oil Storage Area is constructed with two concrete structures: a 15 foot by 15 foot drum handling area, and a 60 foot by 60 foot loading and storage area. Each concrete structure is equipped with drains connected to an oil/water separator and an underground storage tank. The drains are designed to collect spilled oil and precipitation. The facility covers an area of less than 1 acre.

The soils underlying each of the concrete structures may have been affected with fog oil. Fog oil may have reached the soil through seams in the concrete structures. Also, fog oil may have been able to reach the soils prior to the installation of the concrete, when the storage and handling areas were simply constructed of earthen berms.

Specifically, IT will collect five surface soil samples, five subsurface soil samples, five groundwater samples, and three depositional soil samples at Range 4A Fog Oil Storage Area to meet the objectives of the site investigation. Potential contaminant sources at Range 4A Fog Oil Storage Area include fog oil and other petroleum products (gasoline, diesel, oils, and lubricants). Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, and metals. Results from these analyses will be compared with site-specific screening levels developed in the IT 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report*, and regulatory agency guidelines.

This site-specific field sampling plan attachment to the installation-wide sampling and analysis plan (SAP) for Range 4A Fog Oil Storage Area will be used in conjunction with the site-specific

safety and health plan, site-specific unexploded ordnance safety plan, the installation-wide work plan, and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan. Site-specific hazard analyses are included in the site-specific safety and health plan and site-specific unexploded ordnance safety plan.

1.0 Project Description

1.1 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of Range 4A Fog Oil Storage Area, Parcel 123(6), under Delivery Order CK05, Contract Number DACA21-96-D-0018.

This site-specific field sampling plan (SFSP) is an attachment to the installation-wide sampling and analysis plan (SAP) (IT, 2000) for FTMC and has been prepared to provide technical guidance for sample collection and analysis at Range 4A Fog Oil Storage Area, Parcel 123(6). This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) and site-specific unexploded ordnance (UXO) safety plan developed for Range 4A Fog Oil Storage Area, Parcel 123(6), and the installation-wide work plan (WP) (IT, 1998) and SAP. The SAP includes the installation-wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan (QAP). Site-specific hazard analyses are included in the SSHP and site-specific UXO safety plan.

1.2 Site Description

Range 4A Fog Oil Storage Area, Parcel 123(6), is located in north central Pelham Range and is due west of Range 56 in Training Area 4A of Pelham Range (Figure 1-1). The area has been designed for storage of fog oil used to generate smoke for training exercises at FTMC and Pelham Range, and is believed to have been in use since at least 1964. The storage capacity at Range 4A Fog Oil Storage Area, Parcel 123(6), is 75,000 gallons. The Fog Oil Storage Area is constructed with two concrete structures: a 15 foot by 15 foot drum handling area, and a 60 foot by 60 foot loading and storage area. Both the drum handling area and loading and storage area are located inside a fenced-in area. Each concrete structure is equipped with drains connected to an oil/water separator (OWS) and an underground storage tank. The drains are designed to collect spilled oil and precipitation (U.S. Army Center for Health Promotion and Preventive Medicine [CHPPM], 1999). The facility covers an area of less than 1 acre.

The 60 foot by 60 foot loading and storage area at Range 4A Fog Oil Storage Area is sloped and designed to divert spilled oil and precipitation to a floor drain, which is connected to the OWS. Seams once present in the concrete pad have been sealed. The seams were once reported leaking

and eventually may have led to seepage of fog oil onto the ground beneath the pad (Environmental Science and Engineering, Inc. [ESE], 1998).

The original configuration of the loading and storage area at Range 4A Fog Oil Storage Area was an earthen bermed area with drums of fog oil stored on bare soil within the berms prior to the renovation and the current use of concrete. The surface soil is reported as stained with oil from the storage and handling activities. The loading and storage area is designed to store approximately 75,000 gallons of fog oil. However, in 1986, quantities larger than 75,000 gallons were observed. The once earthen-bottomed loading and storage area has been modified to the current 60-foot by 60-foot concrete pad, and elevated containment areas (Figure 1-2) (CHPPM, 1999).

The drum handling area, located north of the loading and storage area, within the fenced area, is a 15 foot by 15 foot, 2 foot deep pit covered with a metal grate, and is plumbed into the OWS via underground piping. Design drawings required for the renovation of Range 4A Fog Oil Storage Area indicate that the drum handling area was originally a sand pit prior to the renovation and current use of concrete (CHPPM, 1999). Oil spills were observed at the staging area that includes the soils outside of the drum staging area. The soils outside of the original drum staging area were noticeably stained (Roy F. Weston, Inc., 1990).

Drums, historically, were stored horizontally in the elevated containment areas. Approximately 150 30-gallon drums were stored at the facility in June 1999, but were to be removed from the facility by October 1, 1999 due to the closure of FTMC (CHPPM, 1999). Three 30-gallon drums were found half-full during a site inspection conducted by IT on November 6, 2000. In addition to fog oil, clean rags, used rags, dry sweep, and minor amounts of fuel were stored at Range 4A Fog Oil Storage Area (CHPPM, 1999).

The length of use as a fog oil loading and storage area is not well recorded. Environmental Photographic Information Center aerial photos taken in 1964 clearly confirm nearly the same appearance as in a 1996 aerial photograph of the area. The area is believed to have been in use since at least 1964 based on the interpretation of the aerial photos.

FTMC has received noncompliance notifications for the OWS due to the lead and total organic carbon exceedances of the discharge limits at Outfall DSN002 at the facility. The discharge limits were raised after an evaluation by regulators in December 1994. Since December 1994,

the permitted levels for lead and total organic carbon have not been exceeded. The quarterly effluent sampling was conducted by the FTMC Directorate of Environment (ESE, 1998).

In 1986, the OWS was found functioning improperly by U.S. Army Environmental Hygiene Agency. The OWS was replaced in 1994 and now features coalescing plates, and is designed to continuously discharge water. The current OWS contains two sumps located at the downgradient end of the 60-foot by 60-foot loading and storage area. Waste oil from the OWS is discharged to the UST. The OWS is recorded as being cleaned out periodically with wastes disposed of through a Defense Reutilization Marketing Office contract (CHPPM, 1999). One groundwater observation well is located directly adjacent to the UST on the east side. Depth of this well is 8.9 feet from the top of well casing.

Range 4A Fog Oil Storage Area, Parcel 123(6), is approximately 200 feet long (north to south) by 170 feet wide (east to west) and covers approximately 0.77 acre. The elevation of Range 4A Fog Oil Storage Area varies from 600 feet to 635 feet (National Geodetic Vertical Datum of 1929). Surface water at the site appears to drain to the southeast. Local shallow groundwater direction at the site is probably controlled by topography; therefore, groundwater direction in the residuum is likely to the southeast.

Soils at Range 4A Fog Oil Storage Area consist of the Clarksville series of soils. The Clarksville series of soils consists of strongly acidic, well-drained soils that have developed in the residuum cherty limestone. Clarksville soils are associated with the Fullerton, Dewey, and Decatur soils.

Soils at Range 4A Fog Oil Storage Area fall into the Clarksville-Fullerton stony loams, 15 to 40 percent slopes (U.S. Department of Agriculture, 1961). The soils in this mapping unit have poor tilth. Their capacity for available moisture is low, and is not suitable for cultivation. About 99 percent of the acreage is in forest. The typical soil description is 1 to 3 feet of well-drained cherty silt loam to cherty silty clay loam; developed from deeply weathered cherty dolomitic limestone. The depth to bedrock is typically greater than 20 feet with depth to water greater than 20 feet.

1.3 Scope of Work

The scope of work for activities associated with the SI at the Range 4A Fog Oil Storage Area, as specified by the statement of work (USACE, 2000), includes the following tasks:

- Develop the SFSP attachment.

- Develop the SSHP attachment.
- Develop the site specific UXO safety plan attachment.
- Conduct a surface and near-surface UXO survey over all areas to be included in the effort.
- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Collect five surface soil samples, five subsurface soil samples, five groundwater samples, and three depositional soil samples to determine whether potential site-specific chemicals (PSSC) are present at the Range 4A Fog Oil Storage Area, and to provide data useful for supporting any future planned corrective measures and closure activities.

Pelham Range is an active range maintained by the Alabama National Guard. Range 4A Fog Oil Storage Area is about 1 mile northeast of the Large Impact area at Pelham Range, and the history prior to 1964 is unclear. Therefore, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at this site. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance. The site-specific UXO safety plan attachment addresses the manner which the avoidance will be conducted.

At completion of the field activities and sample analyses (as listed in Section 4.5), draft and final SI summary reports will be prepared to evaluate the absence or presence of PSSCs at this site, and to recommend further actions, if appropriate. The SI summary report will be prepared in accordance with current U.S. Environmental Protection Agency (EPA) Region IV, and Alabama Department of Environmental Management (ADEM) guidelines.

2.0 Summary of Existing Environmental Studies

An environmental baseline survey was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense guidance for fast-track cleanup at closing installations. The environmental baseline survey also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
2. Areas where only release or disposal of petroleum products has occurred
3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are under way, but all required remedial actions have not yet been taken
6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented
7. Areas that are not evaluated or require additional evaluation.

The EBS was conducted in accordance with the CERFA (CERFA-Public Law 102-426) protocols and U.S. Department of Defense policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of CERCLA-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

During a site inspection conducted by IT on November 6, 2000, a UST monitoring well was observed east and adjacent to the location of the UST at Range 4A Fog Oil Storage Area. The total depth of the well was measured as 8.9 feet deep from the top of the well casing and the depth to water was measured as 2.5 feet deep from the top of the well casing. There is not any historical data available for this well. It is believed that this well is simply an observation well used in conjunction with the OWS. The well appears to be installed in the same backfill as the UST and was likely installed in conjunction with the renovation of the OWS in 1994. There are not any construction details for this well.

Range 4A Fog Oil Storage Area was identified as a CERFA Category 6 site. This CERFA category identifies the recorded release of fog oil onto the ground at the drum handling area and the loading and storage area at Range 4A Fog Oil Storage Area. Range 4A Fog Oil Storage Area requires additional evaluation to determine the environmental condition of the parcel.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objective (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for Range 4A Fog Oil Storage Area, Parcel 123(6). This section incorporates the components of the DQO process described in the publication EPA 540-R-93-071 *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to Range 4A Fog Oil Storage Area is described in more detail in Section 4.3 of this SFSP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and the procedures necessary to meet the objectives of the SI and establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms, along with electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The available data, presented in Table 3-1, related to the SI at Range 4A Fog Oil Storage Area, have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for the data and information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and other USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual chemical contamination in site media.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating the potential risks and hazards to human health in the risk assessment. The CSEM includes receptors and potential exposure pathways appropriate to all plausible scenarios. The CSEM facilitates a consistent and comprehensive evaluation of human health through graphically presenting all possible exposure pathways, including sources, release and transport pathways, and exposure routes. In addition, the CSEM helps to ensure that potential pathways are not overlooked. The elements of a complete exposure pathway and CSEM are:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

Primary contaminant releases were probably limited to leaks and spills that entered subsurface soil. Spills or leaks could also have impacted surface soil through cracks in the concrete pad of the loading and storage area and in the vicinity of the drum handling area. Also, prior to the renovation and the current concrete construction, the loading and storage area and the drum handling area were earthen structures. Spills and leaks in this case would impact the soils directly. Potential contaminant transport pathways include infiltration and leaching to subsurface soil and groundwater, dust emissions and volatilization to ambient air, and erosion runoff to depositional soil. Neither sediment nor surface water is located at the site. Potential receptors considered, but not included under current land-use scenarios, are the:

- **Groundskeeper.** The site is not currently maintained by a groundskeeper.
- **Construction worker.** The site is unused, and no development or construction is occurring.
- **Resident.** The site is not currently used for residential purposes.
- **Recreational Site User.** The site is fenced and covered with concrete. No surface water or sediment are located at the site.

Currently, access to the site is limited by fencing. The site is currently not in use. None of the receptor scenarios developed for FTMC are relevant for this site. The Alabama National

Guardsmen are not directly exposed to the potentially contaminated soil due to the concrete floorings, nor are they exposed to groundwater. In addition, because the soldiers are on site for such short periods of time, any contaminants in the air would most likely be insignificant. A groundskeeper scenario could be applied for the current land use, however it would present the uppermost conservative bounds for soil exposure, which is currently not occurring. Therefore, there are no plausible receptors with the current land use. Future receptor scenarios will be evaluated in place of current receptor scenarios.

Future land use at this site will most likely remain the same, while land use in the surrounding area will be military training. Since the future site use has not specifically been designated, any future land-use receptor scenarios are plausible. Thus the following future land-use receptor scenarios are included in the CSEM:

- **Resident.** Although the site is not expected to be utilized for residential purposes, the resident is considered in order to provide information for the project manager and regulators.
- **Groundskeeper.** The site is likely to have areas that will need to be maintained.
- **Construction Worker.** The site may be developed in the future, thus this receptor is evaluated.
- **Recreational Site User.** Although the site will most likely remain the same, it is surrounded with many acres of forests, providing a good area for recreational purposes.

Hunting will be not be evaluated since the site is small and access has been limited, thus reducing the likelihood for uptake through browsing by deer.

A summary of relevant contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways for this site is provided in Table 3-1 and Figure 3-1.

4.0 Field Activities

4.1 UXO Survey Requirements and Utility Clearances

Pelham Range is an active range currently used by the Alabama National Guard and the Anniston Army Depot for military training activities. Therefore, IT will conduct UXO avoidance activities, including surface sweeps and downhole surveys of soil borings. The site-specific UXO safety plan provides technical guidance for ordnance and explosives avoidance activities for sample collection activities at the Range 4A Fog Oil Storage Area – Pelham Range. The site-specific UXO safety plan attachment has been written in conjunction with Appendix E of the SAP (IT, 2000).

4.1.1 Surface UXO Survey

A UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Hand-held, low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for each avoidance. Subsurface metallic anomalies will not be disturbed, and will also be marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendix E of the approved SAP (IT, 2000). Additionally, the site-specific UXO safety plan attachment has been written in conjunction with Appendix E, Installation-Wide Ordnance and Explosives Management Plan for Support of Hazardous, Toxic, Radiological Waste Activities and Construction Activities (IT, 2000), as a necessary measure for UXO avoidance. The site-specific UXO safety plan attachment is necessary due to the possible UXO hazards at Range 4A Fog Oil Storage Area.

4.1.2 Downhole UXO Survey

During the soil boring and downhole sampling, downhole UXO surveys will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 2000), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet below ground surface, whichever is reached first.

4.1.3 Utility Clearances

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at locations where soil and groundwater samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP (IT, 2000).

The site manager will mark the proposed locations with stakes, coordinate with the necessary local utility companies to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the proposed location stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling program at Range 4A Fog Oil Storage Area includes the collection of surface soil, subsurface soil, groundwater, and depositional soil samples for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition of the site and any further action to be conducted at the site. Additionally, samples will be collected from environmental media in locations that will assist in the assessment of potential ecological impacts resulting from activities at the site.

4.2.1 Surface Soil Sampling

Surface soil samples will be collected from five soil locations at Range 4A Fog Oil Storage Area.

4.2.1.1 Sample Locations and Rationale

The surface soil sampling rationale is listed in Table 4-1. Proposed sampling locations are shown in Figure 4-1. Surface soil sample designations and required quality assurance/quality control (QA/QC) sample requirements are summarized in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

4.2.1.2 Sample Collection

Surface soil samples will be collected from the upper 1 foot of soil by direct-push methodology as specified in Section 4.7.1.1 of the SAP (IT, 2000). Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened for information purposes only, and not to select samples for analysis. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. Sample documentation and chain-of-custodies will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from the five soil borings installed at Range 4A Fog Oil Storage Area.

4.2.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the five soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is listed in Table 4-1. Subsurface soil samples to be collected are listed in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist based on actual field observations and utility clearance results.

4.2.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot below ground surface in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP (IT, 2000).

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithological log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field-screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings exceeding background (readings in ambient air). Typically, the subsurface soil sample showing the highest reading (above background) will be selected and sent to the laboratory for analysis. If none of the samples indicate readings exceeding background using the PID, the deepest interval from the soil boring will be sampled and submitted to the laboratory for analyses. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSCs at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSCs and/or additional sample data would provide insight to the existence of any PSSCs.

Sample documentation and chain-of-custodies will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.3 Permanent Residuum Monitoring Wells

Five permanent residuum monitoring wells will be installed at Range 4A Fog Oil Storage Area. The permanent residuum monitoring well locations are shown on Figure 4-1. The rationale for

the monitoring well locations are presented in Table 4-1. The monitoring well boreholes will be drilled to the top of bedrock or until adequate groundwater is encountered to install a well with a 10 to 20 foot screen. Monitoring wells will be installed using a truck-mounted hollow-stem auger drill rig. The monitoring well casing will consist of new 2-inch inside-diameter, Schedule 40, threaded, flush-joint, polyvinyl chloride pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap polyvinyl chloride well screen, approximately 10 to 20 feet long. The well will be installed so the well screen intersects the water table.

Soil samples for lithology will be collected continuously every 5 feet to the total depth of the hole during hollow-stem auger drilling to provide a detailed lithologic log. The samples will be collected for lithology using a 24-inch-long, 2-inch-or-larger-diameter, split-spoon sampler. The soil borings will be logged in accordance with American Standard for Testing and Materials Method D 2488 using the Unified Soil Classification System. The soil samples will be screened in the field using a PID. The monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000). The exact monitoring well locations will be determined in the field by the on-site geologist, based on actual field conditions.

4.2.4 Groundwater Sampling

Groundwater samples will be collected from the five monitoring wells completed at Range 4A Fog Oil Storage Area, and the one existing monitoring well as described in Section 4.2.3.

4.2.4.1 Sample Locations and Rationale

Groundwater samples will be collected from the monitoring well locations shown on Figure 4-1. The groundwater sampling rationale is listed in Table 4-1. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-3.

4.2.4.2 Sample Collection

Prior to sampling monitoring wells, static water levels will be measured from each of the five monitoring wells installed at the site to define the groundwater flow in the residuum aquifer. Water level measurements will be performed as outlined in Section 4.18 of the SAP (IT, 2000). Groundwater samples will be collected in accordance with the procedures outlined in Section 4.9.1.4 of the SAP.

Sample documentation and chain-of-custodies will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP (IT, 2000). The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.5 Depositional Sampling

Three depositional samples will be collected from Fog Oil Storage Area, Parcel 123(6).

4.2.5.1 Sample Locations and Rationale

The proposed locations for the depositional samples are shown in Figure 4-1. Depositional sampling rationale is presented in Table 4-1. The depositional sample designation and required QA/QC sample requirements are listed in Table 4-2. The actual depositional sample points will be at the discretion of the ecological sampler, based on the drainage pathways and actual field observations.

4.2.5.2 Sample Collection

The depositional samples will be collected in accordance with the procedures for sediment sampling as specified in Section 4.9.1.2 of the SAP. Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. The depositional samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.3 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP (IT, 2000). Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.4 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary, to obtain the required level of accuracy. Horizontal coordinates will be referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum, 1983. Elevations will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use permanent monitoring wells to determine water levels, a higher level of accuracy is required. Monitoring wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required. Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP. All areas at this site must be cleared for UXO avoidance before any surveying activities will commence.

4.5 Analytical Program

Samples collected at locations specified in this chapter of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from Range 4A Fog Oil Storage Area, Parcel 123(6), consist of the following list of analytical suites:

- Target compound list volatile organic compounds - Method 5035/8260B
- Target compound list semivolatile organic compounds - Method 8270C
- Target analyte list metals - Method 6010B/7000.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-4 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms along with electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

4.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP (IT, 2000). Completed analysis request/chain-of-custody records will be secured and included with each shipment of coolers to:

Attn: Elizabeth McIntyre
EMAX Laboratories, Inc.
630 Maple Avenue
Torrance, California 90503
Telephone: (310) 618-8889.

4.7 Investigation-Derived Waste Management

Management and disposal of the investigation-derived wastes will follow procedures and requirements as described in Appendix D of the SAP (IT, 2000). The investigation-derived wastes expected to be generated at Range 4A Fog Oil Storage Area, Parcel 123(6), will include decontamination fluids, drill cuttings, and disposable personal protective equipment.

4.8 Site-Specific Safety and Health

Health and safety requirements for this SI are provided in the SSHP attachment for Range 4A Fog Oil Storage Area. The SSHP attachment will be used in conjunction with the installation-wide safety and health plan. Additionally, the site-specific UXO safety plan attachment has been prepared as a necessary measure for UXO avoidance.

5.0 Project Schedule

The project schedule for the SI activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team and will be in accordance with the installation-wide WP.

6.0 References

Environmental Science and Engineering, Inc. (ESE), 1998, ***Final Environmental Baseline Survey, Fort McClellan, Alabama***, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation (IT), 2000, ***Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama***, March.

IT Corporation (IT), 1998, ***Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama***, August.

U.S. Army Center for Health Promotion and Preventative Medicine, (CHPPM), 1999, ***Draft Preliminary Assessment No. 38-EH-1775-99, Fort McClellan Army National Guard Training Center, Fort McClellan, Alabama***, June.

U.S. Army Corps of Engineers (USACE), 2000, ***Statement of Work for Task Order CK05, Modification No. 10, National Guard Memorandum of Agreement Sites, Fuel/Training Areas SI, Waste Chemical Storage Area SI, Fire Training Pit SI, Industrial Landfill Remedial Design, UST Review, Range J RI, and Partnering Facilities at Fort McClellan, Alabama***, September.

U.S. Army Corps of Engineers (USACE), 1994, ***Requirements for the Preparation of Sampling and Analysis Plan***, Engineer Manual EM 200-1-3, September 1.

U.S. Department of Agriculture, 1961, ***Soil Survey, Calhoun County, Alabama***, Soil Conservation Service, Series 1958, No. 9, September.

U.S. Environmental Protection Agency (EPA), 1993, ***Data Quality Objectives Process for Superfund, Interim Final Guidance***, EPA 540-R-93-071, September.

Roy F. Weston, Inc., 1990, ***Enhanced Preliminary Assessment Fort McClellan, Alabama Vols I, II (Appendices)***, Report No. CETHA-BC-CR-90181.

ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS